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EDITORIAL

APPROACHES TO CASE FINDING

Case finding has long been considered one of the most significant techniques of tuberculosis control. Within recent years, the efforts of voluntary and official agencies have succeeded in engendering such widespread popular interest in mass case finding that it has been possible to contemplate its nation-wide acceleration. As in the past, the program will be approached entirely on the basis of voluntary participation.

With the enactment of recent legislation in Alabama, however, we may observe a departure from the voluntary approach to mass case finding. On August 6 last, the Governor of Alabama signed into law an Act requiring that all residents of the State between the ages of 13 and 50 submit to examination for tuberculosis. Furthermore, the law imposes fines for noncompliance. As an example of health legislation, this statute must be viewed with more than casual interest, for this is the first time in the history of the Nation that mass case finding has been placed under the force of State law.

Beyond its intrinsic interest as health legislation at the State level, we find implicit in the Alabama program the entire question of compulsory and voluntary approaches to health problems. There can be little doubt that some problems of disease control require the force of law. In the matter of the isolation of open, infectious cases of tuberculosis, for example, there is now little controversy. The fact that isolation here is so overwhelmingly in the public interest renders entirely defensible the use of legal compulsion. Despite the fact that this has long been recognized by epidemiologists, the public was slow to acknowledge it, and positive action resulted only after

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public enlightenment had led to the conviction that legal measures were indeed imperative. Today, we find that most States specifically require the isolation of infectious tuberculosis, forcible if necessary, in the interest of public health and safety.

In case finding, on the other hand, it has been found that the voluntary approach to community-wide surveys can be so effective that well over 80 percent of an eligible population group can be studied in a relatively short period of time. Such results have been assured, however, only through effective community organization and action. Indeed, the public's desire to participate in case finding has reached such proportions that the nation-wide potentialities of the program are limited only by the funds and personnel available for the work. Although much already has been accomplished there is still a shortage of the tools necessary to achieve nation-wide coverage. Assuredly, the effective operation of any law which envisions the mass surveying of large population groups must contend with these same deficiencies.

It is not our function, however, to conjecture the administrative problems which may confront the operation of the Alabama program. Nor is it within our province now to inquire into the desirability of such legislation generally. More important, the people of Alabama have, in the passage of this legislation, recognized that tuberculosis goes all too frequently undetected, and have taken legal recourse to search out the hidden cases which are the chief carriers of the disease.

"Human nature," observed Ralph Waldo Emerson, "expresses itself in laws as characteristically as in statues, or songs, or railroads; and an abstract of the codes of nations would be an abstract of the common conscience." If this be true, and there is indeed little doubt of it, the enactment of the type of health legislation here under discussion bears added witness to the public conviction that direct action, voluntary or compulsory, is necessary if man is ultimately to provide a safe and healthful environment for himself, his family, and his fellows.

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A REPORT ON TEN PROVED CASES OF HISTOPLASMOSIS ¹

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Histoplasmosis has been considered a rare, uniformly fatal disease. Only 74 cases had been reported by January 1945 (1) and at the present time the total number of cases reported is less than 100. The true prevalence of the disease is unknown, but it is suspected that the disease in some form occurs more frequently than the number of reported cases would indicate; a mild, nonfatal form of histoplasmosis may be widely prevalent (2, 3). Furthermore, whenever intensive search for the disease has been made, a marked increase in the number of reported cases has resulted. This occurred in Ann Arbor (1), Nashville (4), and is now true in Kansas City.

The present article reports 10 proved cases of histoplasmosis found in the Kansas City area. These cases illustrate the fact that histoplasmosis varies from a mild infection with subclinical manifestations to the previously recognized acute, fatal illness. That 9 of these 10 cases were diagnosed within a period of 9 months supports the view that such infection is not a rare occurrence.

Histoplasmin and tuberculin skin-test data and complement fixation test results are reported for each patient. In addition, cultural and animal inoculation studies for pathogenic fungi and tubercle bacilli are reported for 9 of the 10 patients.

MATERIAL AND METHODS

During the last 2½ years, a large group of persons has been studied by the authors. These patients were selected during routine skin-test and X-ray surveys in public schools, found on hospital wards, or referred for study by private physicians because histoplasmosis was suspected.

Preliminary procedures included chest X-rays and skin tests with tuberculin and histoplasmin. As a result of these screening tests, a number of persons was selected for whom the diagnosis of histoplasmosis remained a possibility. These patients were studied further by cultural and serologic methods and the possibility of the diagnosis of active histoplasmosis was eliminated for the majority. There remained a group of patients in whom active histoplasmosis was suspected on the basis of radiologic (5) or serologic (6) evidence. Among these suspects the diagnosis of histoplasmosis was established in 10 cases.

All 10 of these cases were studied in hospitals. Routine admission physical examinations and laboratory work (complete blood count,

¹ From the Office of Field Studies, Tuberculosis Control Division.

urinalysis, chest X-ray) were done on all patients. In addition, the following specific diagnostic procedures were employed:

Skin tests.—All patients were skin-tested with tuberculin (PPD-S 0.0001 mg.) and histoplasmin (H-15, 1:1000). All but case 10 were tested with blastomycin (B-7, 1:1000). The fungus antigens were prepared and titrated for potency in infected animals according to the method outlined by Howell (7). In addition, extracts of *Candida albicans*, *Haplosporangium parvum*, *Trichophyton mentagraphytes*, *Actinomyces bovis*, *Aspergillus fumigatus*, *A. clavatus*, *A. terreus*, and *Alternaria* were used on cases 1, 2, 3, and 7. These extracts were prepared by Dr. Arden Howell and Assistant Sanitarian (R) Forrest W. Cross and were employed in a dilution of 1:1000. Coccidioidin (1:100) used in cases 1, 2, 3, 7, and 8, was furnished by Dr. Charles B. Smith of San Francisco.

All tests were made by the intracutaneous method, employing 0.1 cc. of the appropriate solution. Readings were taken at 48 hours. A reaction in which the induration measured 5 mm. or more in diameter was considered positive.

Complement fixation tests.—These tests were performed on serum from each patient, using histoplasmin and blastomycin as antigens (8). When antibodies to both these antigens were present, the serum was diluted in successive tests to determine which antibody was present in higher concentration.

Cultures.—Employing both synthetic media and animal inoculation, a thorough search was made for tubercle bacilli and pathogenic fungi in material from these patients. Sputum, gastric washings, blood, bone marrow, biopsy and autopsy tissues were utilized. Smears, cultures and guinea pig inoculations were employed to demonstrate tubercle bacilli; Petrik's and Petragnani's media were used as culture media. Culture and mouse inoculation were used to demonstrate pathogenic fungi; potato dextrose and brain-heart-infusion blood agar were the fungus culture media. Twenty units of penicillin and 40 units of streptomycin were added to each ml. of fungus media (9), and cultures were incubated at both 25° and 37° C.

CASE REPORTS

Mild Illness, With Recovery

Case 1, C. D.,² white male, age 13 years. The patient had been a resident of Kansas City, Mo., for 4 years, having previously lived 1½ years in Illinois, and before that, 4 years in Oklahoma and 4 years in Texas. He was selected for study because of widespread miliary lung lesions detected on a chest X-ray in February 1945 taken as part of a skin test and X-ray survey of school children of Kansas City, Mo. He was a nonreactor to tuberculin.

² Studied in cooperation with Dr. Herbert L. Mantz of Kansas City, Mo.

History.—The patient was a supposedly healthy school child. In response to questioning, he reported malaise and headaches for 3 months.

Admission findings.—First admission, April 1945: During the first 7 days, a low-grade afternoon fever was noted (seldom exceeding 100°, but once up to 101°). During the last 3 days no fever was noted. Physical examination failed to reveal any abnormalities. Examination of the chest was negative. The liver, spleen, and nodes were not enlarged. An X-ray on April 24, 1945, showed military lesions in both lung fields with bilateral enlargement of hilar lymph nodes.

A blood count showed 4,200,000 rbc per cu. mm. with 12 gm. Hgb, and 8350 wbc per cu. mm. with 58 percent polymorphonuclear leucocytes, 37 percent lymphocytes, and 5 percent eosinophils. The blood sedimentation rate was 25 and 29 mm. per hour (Cutler method). Urinalysis was negative. Routine agglutination tests were negative (typhoid fever, paratyphoid fever A and B, brucellosis). The patient was discharged after 10 days observation and study.

Second admission, November 1945 (to obtain 3 gastric washings for culture): The patient had exhibited a low-grade fever following discharge from the hospital in April 1945 and was kept on partial bed rest until September, at which time he returned to school. His temperature was normal. Physical examination disclosed palpable lymph nodes in the axilla, neck and inguinal area, of which only those in the inguinal area were believed to be enlarged. Examination of the chest was negative; the liver and spleen were not enlarged. The X-ray, urine and blood count were unchanged from the previous admission. The sedimentation rate was still elevated (21 mm. in 1 hr.). An agglutination test for brucellosis was negative. The patient was discharged after 3 days.

Skin test.—Histoplasmin was not available for skin testing until the second hospital admission. Still tuberculin negative, the patient was found on November 26, 1945 to have a positive reaction to histoplasmin of 9 mm. induration. Almost 2 years later, still histoplasmin-positive, the patient was skin-test negative to other fungus antigens.

Complement fixation tests.—Serum was first available for serologic testing 2½ years after the onset of symptoms. This serum gave a negative complement fixation test for both histoplasmosis and blastomycosis (August 18, 1947). Sera of September 15, 1947 and September 17, 1947 both showed complete (+++++) fixation with histoplasmin and no fixation with blastomycin.

Mycology and bacteriology.—First admission: Three concentrated sputum smears were negative for tubercle bacilli. Four stool specimens were examined for ova and none were found.

Second admission: Three gastric specimens were obtained November 23, 1945, November 24, 1945, and November 25, 1945. A single colony of *Histoplasma capsulatum* was isolated on one plate from the first specimen. All other plates were negative. The three specimens were negative for tubercle bacilli by smear, culture and guinea pig inoculation. Eighteen subsequent gastrics over a period of the next 6 months were negative for tubercle bacilli and pathogenic fungi by culture.

Sternal marrow and peripheral blood obtained November 23, 1945 were negative for organisms by smear and culture.

Biopsy of an axillary lymph node was performed December 31, 1946; the gland was negative for tubercle bacilli and pathogenic fungi by microscopic study, culture, and animal (guinea pig, hamster) inoculation.

Course.—The patient has been out of the hospital 2 years. He feels well and attends school. The temperature and sedimentation rate are normal. The lung lesions appear to be calcifying. The histoplasmin skin test has remained positive on three subsequent retests.

Severe Clinical Illness, With Recovery

Case 2, W. B.³ white, male, age 5 months. The infant lived on a farm in a small town 100 miles south of Kansas City, Mo. He was selected for study because of the clinical picture he presented (fever, hepatomegaly, splenomegaly, anemia, leucopenia).

History.—The patient had an illness of 3 weeks' duration consisting of vomiting, fever (104°) and a convulsion.

Admission findings.—March 1, 1947: Positive physical findings included fever (105°), redness of both ear drums, hepatomegaly and splenomegaly.

A blood count showed 2,910,000 rbc per cu. mm. with 68 percent Hgb and 3,650 wbc per cu. mm. with 48 percent polymorphonuclear leucocytes and 51 percent lymphocytes. The sedimentation rate was 11 mm. per hr. Agglutinations for typhoid fever, paratyphoid fever (A and B), and brucellosis were negative. The total serum protein was 6.0 gm. per 100 cc., with albumin 4.08 and globulin 1.92. The chest X-ray was negative.

Skin tests.—On the second hospital day, histoplasmin and tuberculin tests were negative. On the 46th hospital day, the tuberculin test was still negative, but the histoplasmin test was positive (5 mm. of induration). On the 80th hospital day, the histoplasmin test was still positive, but tests with other fungus antigens were negative. Subsequent retests during the 3d, 4th, 6th and 8th months of hospitalization showed positive histoplasmin tests.

Complement fixation tests.—The complement fixation test for histoplasmosis was positive (+++++) on July 1, 1947 (125th hospital day). Serum drawn July 10, 1947, August 15, 1947, October 3, 1947, and November 10, 1947, also gave a positive (+++++) test, whereas serum of September 29, 1947, gave a 2+ complement fixation test.

When blastomycin was used as the antigen with the serum drawn on November 10, 1947, a 1+ complement fixation was noted. When this serum was diluted 1:2, no fixation was noted with blastomycin whereas complete (+++++) fixation was still obtained with histoplasmin. The sera of September 29, 1947 and October 27, 1947 showed no fixation with blastomycin. The remaining sera were not tested with blastomycin.

Mycology and bacteriology.—Cultures of blood and sternal marrow, secured on March 21, 1947 (20th hospital day) were positive for *Histoplasma capsulatum*. Six other blood cultures had been taken during the first 46 hospital days; these had been sent to the hospital laboratory, kept there 10 days, recorded as negative and discarded. Blood cultures drawn on March 18, 1947, April 8, 1947, May 2, 1947, May 20, 1947, June 17, 1947, July 9, 1947, July 23, 1947, August 5, 1947, and August 19, 1947 were observed for a month and were negative.

Marrow smears were not examined for the presence of organisms.

Course.—The left ear drum ruptured on the 2d hospital day; the otitis then cleared. For 7 weeks the patient had a spiking temperature (up to 105°–106°), severe anemia (2,010,000 rbc per cu. mm.) and leucopenia (3,000 wbc per cu. mm.) Then slow improvement was noted.

The patient was discharged on December 20, 1947, after 9½ months hospitalization. At that time the liver and spleen were just palpable, and the temperature had been below 100° for 4 weeks. He had gained 3½ pounds in the last 3½ months. A blood count of November 25, 1947 showed 4,100,000 rbc per cu. mm. and 8,500 wbc per cu. mm.

³ Studied in cooperation with Dr. J. C. McQueen, resident physician, Children's Mercy Hospital, Kansas City, Mo.

Severe Clinical Illness, Recovery Probable

Case 3, S. P.⁴ white female, age 20 months. The patient was a resident of a Kansas town 200 miles southwest of Kansas City. She was selected for study because of the clinical picture she presented (fever, hepatomegaly, splenomegaly, anemia, and leucopenia).

History.—Protuberant abdomen and malaise for 4 months, following a period of fever diagnosed as influenza.

Admission findings.—March 23, 1947: Examination revealed a pale, emaciated infant with a temperature of 100°. The liver, spleen and peripheral lymph nodes were enlarged. A precordial systolic murmur was heard.

A chest X-ray revealed probable enlargement of the right hilar node with infiltration extending to the right base.

The red blood cell count was 3,060,000 per cu. mm. with 45 percent Hgb, while the white cell count was 6,400 per cu. mm., with 34 percent polymorphonuclear leucocytes and 68-percent lymphocytes. The platelet count was 160,000 per cu. mm.

Urinalysis showed only a trace of albumin. Total serum proteins were 5.12 with an albumin-globulin ratio of 3.29: 1.83. Sternal puncture study revealed a normal marrow; the marrow was not cultured.

Skin tests.—The tuberculin and histoplasmin skin tests were reported as negative on the 2d hospital day, but when repeated on the 85th hospital day (Aug. 25, 1947), the histoplasmin test was found to be positive (7 mm. of induration). On September 2, 1947, the patient was tested with other fungus antigens. A positive reaction was elicited only with blastomycin in a dilution of 1:1,000 (6 mm. induration). When the dilutions of histoplasmin and blastomycin were increased (1:2,000 and 1:5,000) blastomycin failed to elicit a reaction whereas histoplasmin was positive in both dilutions.

Complement fixation tests.—Serum of September 4, 1947, showed a 2+ anti-complementary effect. Sera obtained on September 11, 1947, October 13, 1947, and December 4, 1947 gave a positive (+ + + +) complement fixation test for histoplasmosis. Of these three latter sera, only that of October 13, 1947, showed any fixation (+ +) when blastomycin was used as antigen. When the serum was diluted 1:2, complete (+ + + +) fixation was still obtained with histoplasmin whereas no fixation (0) was obtained with blastomycin.

Mycology and Bacteriology.—Splenectomy was performed on the 90th hospital day; at operation an abdominal lymph node was removed and a biopsy of liver obtained. Culture of spleen yielded *Histoplasma capsulatum*. Multiple granulomata were noted in the excised spleen, node, and liver biopsy, though typical *Histoplasma* were not identified by microscopic study of the sections. A positive culture for *H. capsulatum* was obtained from the spleen of one of four mice inoculated with ground splenic tissue.

Three gastric aspirations were performed on September 2, 1947, September 3, 1947, and September 5, 1947; the specimens were inoculated into three mice and cultured. Two of the three mice were negative. The third is as yet unreported. From the specimen of September 2, 1947 (106th hospital day) *H. capsulatum* was isolated by culture. Cultures of spleen and gastric contents were negative for tubercle bacilli.

Two blood cultures of September 4, 1947 and October 13, 1947 were negative after 1 month.

⁴ Reported through the courtesy of Dr. Herbert Miller, Department of Pediatrics, University of Kansas School of Medicine.

Course.—Between the 19th and 43d hospital days, the patient received 2,587 “r” (depth dose) of X-ray therapy over the spleen. Following this, the red blood cell count decreased and several transfusions were administered. The patient tolerated the transfusions poorly and developed fever of 104°–105° for several weeks. Due to the progressive thrombocytopenia (22,000 per cu. mm.) and leucopenia (2,150 wbc per cu. mm.), splenectomy was performed.

The patient's course has been favorable since her operation. Her temperature slowly fell to normal, her appetite improved and she was discharged from the hospital September 11, 1947, on the 114th hospital day. She has been followed at the clinic and has been observed to be stationary in weight and free of fever for 2 months. It is now 5 months since the operation and 12 months since the onset of symptoms.

Severe Clinical Illness, Recovery Questionable

Case 4, G. M.⁵ white male, a farmer, age 52 years. The patient has been a resident of Topeka, Kans., for many years. He was referred for study because of unexplained pulmonary lesions, a negative tuberculin but a positive histoplasmin skin test, and a positive (++++) complement fixation test for histoplasmosis.

History.—The patient's illness was of 3½ months duration, and consisted of cough, recurrent bouts of fever, anorexia, weakness, and loss of weight.

Admission findings.—October 26, 1947: The temperature was 99° and the blood pressure 130/80. Several lesions resembling basal cell epitheliomas were noted on the face; these had been present for 20 years. There was a rough systolic murmur in the left third interspace; the second pulmonic sound was accentuated. The left side of the chest showed diminished excursion, dullness and increased voice transmission. Rales were heard over both lower chest areas. The liver was slightly enlarged; the spleen was not felt. The peripheral lymph nodes were not enlarged.

A chest X-ray showed infiltration throughout the entire left lung and in the right upper lobe, with the heart displaced to the left. The apical pleura was thickened. Bronchograms revealed moderate cylindrical bronchiectasis on both sides.

A blood count showed 4,010,000 rbc per cu. mm., with 11.0 gm. Hgb, and 10,950 wbc per cu. mm. with 63 percent polymorphonuclear leucocytes, 28 percent lymphocytes, 6 percent eosinophils and 3 percent monocytes.

The blood sugar was 109 mg. percent, creatinine 1.5 mg. percent, and the N. P. N. 30. Total serum proteins were 6.83 gm. per 100 cc. (albumin 4.02 and globulin 2.81).

Skin tests.—On the 2d hospital day, the tuberculin skin test was negative and the histoplasmin skin test was positive (11 mm. of induration). On the same day, a skin test with blastomycin was negative. In addition to these tests, the patient had a record of a previous positive histoplasmin and negative tuberculin test.

Complement fixation tests.—Sera obtained October 8, 1947, October 23, 1947, and October 28, 1947 gave positive (++++) complement fixation tests for both histoplasmosis and blastomycosis. Similar results were found when the serum was diluted 1:2. When the serum was diluted 1:4, complete (++++) fixation was still noted with histoplasmin whereas only 1+ fixation was obtained with blastomycin.

Mycology and bacteriology.—*H. capsulatum* was cultured from each of two sputum specimens obtained October 27, 1947 and October 28, 1947. That of

⁵ Referred by Dr. M. E. Roe, Hillcrest Sanatorium, Topeka, Kans.

October 29, 1947 was negative by culture. A gastric of October 27, 1947 was negative by culture. None of the sputa or gastrics was inoculated into animals. A biopsy of one of the skin lesions on the face was negative by culture for pathogenic fungi. Cultures obtained by bronchoscopy were negative for pathogenic fungi.

Course.—The patient was discharged from the hospital after 7 days' study. He was seen 6 weeks after discharge, on January 5, 1948. He was feeling well and had gained 17 pounds in the past 3 months. His temperature was normal. He raises 1 ounce of sputum in the morning. A chest X-ray showed an apparent spread of the infiltrative process to the right mid-lung field. A blood count showed 10,250 wbc per cu. mm. with 68 percent polymorphonuclear leucocytes, 22 percent lymphocytes, 8 percent monocytes and 2 percent eosinophils.

Serious Clinical Illness, Recovery Questionable

Case 5, R. J., a 64-year-old male clerk who had lived all his life within 25 miles of Kansas City, Mo. He was studied because his serum showed a positive (+ + + +) complement fixation test for histoplasmosis.

History.—Since June 1947 the patient has had a chronic cough with a small amount of sputum but no hemoptysis. In October 1947 he developed a severe diarrhea without blood. This persisted until the time of admission on December 5, 1947. He had lost about 25 pounds in weight in the 5 months preceding admission.

Admission findings.—Positive physical findings were limited to clubbing of the fingers, palpable axillary nodes and signs of cavitation in the upper lobe of the right lung. Spleen and liver were not palpable. The white blood count was 17,900 per cu. mm. with 79 percent polymorphonuclears, 9 percent lymphocytes, 6 percent monocytes and 6 percent eosinophils. The hemoglobin was 11.5 grams per 100 cc. Sedimentation rate was 27 mm. in 1 hour (Cutler method). Urine was negative.

Skin tests.—Tuberculin skin tests were positive on the 12th and 31st hospital days. Histoplasmin skin tests were positive on the 2d, 12th, and 31st hospital days. Blastomycin skin tests were negative on the 31st hospital day.

Complement fixation tests.—A positive (+ + + +) complement fixation test for histoplasmosis was found for the patient's sera drawn on the 2d, 14th, and 31st hospital days. A positive (+ + + +) blastomycosis complement fixation test was found on the first and third sera while the second serum was negative. Serum dilutions employing histoplasmin and blastomycin as antigens have not as yet been completed.

Mycology and bacteriology.—Four sputa and three gastric lavages have been cultured for fungi and tubercle bacilli and injected into mice and guinea pigs. The complete reports are not yet available but the gastric lavage of December 22, 1947 has yielded large numbers of typical colonies of *H. capsulatum*. No tubercle bacilli have grown as yet on culture (6 weeks). Nine sputa have shown negative smears for acid-fast organisms by the concentration method.

Course.—It is yet too early to estimate the eventual outcome of this case. The patient runs a slight elevation of temperature (up to 99.8°) and his sedimentation rate remains above normal (26, 31). He continues under hospital observation.

Severe Clinical Illness; Death Following Surgery

Case 6, J. G., white male, a student, age 26. He had been a resident of Kansas City, Mo., for 2½ years, having previously been in the Army, serving in Germany 2½ years. He was born, 100 miles southeast of Kansas City, Mo., and lived there

for 20 years. He was selected for study because of a positive complement fixation test for histoplasmosis.

History.—The patient had had an episode of hemoptysis 2 years before the present illness. Now, he complained of a similar episode which had followed 2 weeks of chest pain and aggravation of a chronic cough. He had lost 20 pounds in weight over a 6-month period.

Admission findings.—First admission, June 13, 1947: The patient was a well-nourished young man coughing up large amounts of blood. He had a normal temperature. Examination revealed diminished breath sounds and coarse rales over the right lung. The liver, spleen, and peripheral lymph nodes were not enlarged. A chest X-ray showed only accentuation of the markings extending downward from both hilar areas, particularly on the right. The red cell count was 3,010,000 per cu. mm., with 8.3 gm. Hgb. The white cell count was 8,950 per cu. mm. with 64 percent polymorphonuclear leucocytes, 30 percent lymphocytes, and 6 percent monocytes.

Conservative therapeutic measures failed to check the bleeding and on July 4, 1947 (21st hospital day) a right lower lobectomy was performed. The bleeding ceased, but a bronchopleural fistula developed. The patient was discharged on July 28, 1947, to return in 1 month for surgical repair of the bronchopleural fistula.

Second admission, August 28, 1947: For the preceding month, the patient was in as good health as a bronchopleural fistula would permit. Physical examination revealed only a well-healed wound in the right chest, and the signs of a right pneumothorax. A chest X-ray showed complete pneumothorax on the right; an increase in the mottling and striation on the left was also noted. A blood count showed 3,900,000 rbc per cu. mm., with 11.5 gm. Hgb, and 8,600 wbc per cu. mm. An operation was performed.

Skin test.—On July 5, 1947, the patient had a positive tuberculin (17 mm. induration) and histoplasmin skin test (17 mm. induration). The same results were obtained on July 22, 1947 and August 12, 1947. The blastomycin skin test was negative (August 12, 1947).

Complement fixation tests.—Serum of July 5, 1947 showed a 1+ complement fixation for histoplasmosis; that of July 9, 1947, a positive (++++) result; that of July 22, 1947, ++, that of August 12, 1947, ++, and that of September 3, 1947, 1+. The serum of July 9, 1947 which had shown ++++ fixation with histoplasmin, also showed ++++ fixation with blastomycin. Sufficient serum of this date was not available to employ serial serum dilutions to demonstrate differences between antibody titers against these two antigens.

Mycology and bacteriology.—One blood culture (September 3, 1947) and three sputum cultures (July 8, 1947, August 14, 1947, August 15, 1947) were negative for pathogenic fungi and tubercle bacilli by culture, but positive for tubercle bacilli by animal inoculation.

Cultures of pooled organs obtained at autopsy were negative for *H. capsulatum* but positive for tubercle bacilli. Mice were inoculated with ground, pooled autopsy tissue: one died 22 days later. Culture of the brain and spleen of this mouse yielded growth of *H. capsulatum*.

Course.—The patient's hemoptysis was stopped by resection of the right lower lobe. The procedure was technically difficult and had to be completed by the placing of mass hilar ligatures. Following the first operation, a bronchopleural fistula developed.

At the second operation, decortication of most of the visceral pleura was performed, as well as closure of the right lower lobe bronchus. At the conclusion of the surgery, the patient was in surgical shock. He expired less than 24 hours after surgery, without regaining consciousness.

Autopsy revealed complete atelectasis of the remaining two lobes of the right lung, small firm nodules in the left upper lung and interstitial hemorrhage in the cortex of the right kidney.

Microscopically, the lung contained numerous tubercle-like lesions, with epithelioid cells, giant cells, and central necrosis. *Histoplasma* have not been definitely identified in these lesions.

Progressive Fatal Disease

Case 7: F. T.⁶ a 48-year-old white male pattern maker, lived only 6 months in Kansas City. He had moved here from Detroit, Mich., which had been his home for at least 25 years.

He was studied because of X-ray findings suggestive of tuberculosis, accompanied by a negative tuberculin skin test.

History.—The patient's chief complaints were fever, weight loss and weakness beginning about 2½ years before the present admission. At that time he was studied in a Detroit hospital where the chief findings were anemia, splenomegaly, and bilateral lung infiltrations. Tuberculosis was suspected but never proved even after laboratory study. His tuberculin test was negative. A diagnosis of pernicious anemia was made and liver therapy was instituted. He improved but was never able to do more than restricted work. Four weeks before his final admission, he developed chills and fever and progressive weakness.

Admission findings.—May 20, 1947: Moist rales were heard in the left midlung and the breath sounds were increased at the left apex. No cough or sputum was noted. The spleen was palpable; the liver was not palpable. No peripheral lymph nodes were palpated. The temperature was 103° and the blood pressure 105/65. The red blood count was 3,500,000 per cu. mm. with 10.5 gm Hgb. The white cell count was 1,000 per cu. mm. with 20 percent polymorphonuclear leucocytes, 56 percent lymphocytes, 4 percent eosinophils and 20 percent monocytes. Blood sedimentation rate was 27 mm. in 60 minutes (Cutler method). Urinalysis was negative. X-rays of the chest showed bilateral "stringy" infiltrations in both apical areas.

Skin tests.—Histoplasmin and tuberculin skin tests were negative on the 8th hospital day. When repeated 5 weeks later the histoplasmin test was positive (15 mm. of induration) while the tuberculin was again negative. Histoplasmin tests were again positive, during the 7th, 8th, and 10th weeks of hospitalization. Skin tests with other fungus antigens during the 7th week were negative.

Complement fixation tests.—The serum of this patient obtained on July 1, 2, and 16 showed a positive (++++) complement fixation test for histoplasmosis. Serum of July 8 showed only 1+ fixation. The serum of July 2 also showed a positive (++++) blastomycosis complement fixation test. When this serum was diluted 1:2 there was still ++++ fixation with histoplasmin but only ++ fixation with blastomycin. When diluted 1:4 the serum showed 1+ fixation with histoplasmin and none with blastomycin. Blastomycosis complement fixation tests were not performed on the other sera from this patient.

Mycology and bacteriology.—Gastric washings were obtained on May 27, 28, and 29. Smear, culture and animal inoculation of these specimens were negative for tubercle bacilli. Culture of these gastric washings for fungi revealed profuse typical growth of *H. capsulatum* on the specimen of May 29. Splenectomy was performed on July 2, 1947. The spleen showed miliary nodules grossly. Direct smear of plenic pulp and microscopic study of the spleen revealed typical intra-

⁶ Reported through the courtesy of Dr. Graham Asher, of Kansas City, Mo.

cellular *Histoplasma*. This fungus was also recovered on culture of the spleen. No attempt was made to isolate tubercle bacilli from this organ.

The patient died on September 8, 1947. Post mortem cultures of the mesenteric, thoracic, hilar and axillary nodes, adrenal, testes, sternal marrow, liver, lung, prostate, kidney and pectoral muscle were positive for *H. capsulatum*. Cultures of the cardiac muscle were negative for pathogenic fungi. Attempts to isolate tubercle bacilli were made from only the lung and adrenal. The lung was positive for tubercle bacilli by smear, culture and guinea pig inoculation. The adrenal was positive for tubercle bacilli only by guinea pig inoculation, smear being negative and cultures contaminated.

Pathological examination revealed a large number of typical intracellular *Histoplasma* in the lungs, liver, adrenal, heart muscle, kidney, sternal marrow, and intestine. In addition, a number of acid-fast bacilli were seen in focal suppurative lesions in the lung and adrenal;⁷ no tubercles typical of tuberculosis were identified.

Course.—The patient's condition constantly deteriorated. His spleen became larger and his liver became palpable. He continued to run a fever up to 104° daily. His anemia became more severe (down to 1,000,000 red blood cells per cu. mm.). His platelets fell as low as 72,000 per cu. mm. and his reticulocytes at one time were as high as 58 percent. The infiltrations in his lungs increased and spread to the lung bases. Because of his anemia and steadily deteriorating condition, splenectomy was performed on July 2, 1947. The spleen was enlarged at operation and was studded with small nodules. The patient was given many transfusions which were poorly tolerated and usually accompanied by reactions. The downhill course continued and the patient expired on September 8, 1947.

Autopsy findings.—There was marked infiltration of the upper lobe of the left lung with necrosis, calcified hilar lymph nodes, enlarged thoracic and abdominal lymph nodes, miliary lesions of the liver, mucosal ulceration of the small bowel and gall bladder, and fluid accumulations in the body cavities.

Progressive Fatal Disease

Case 8, E. W.,⁸ white female, a housewife, age 53. The patient had been a resident of Kansas City, Mo., for 24 years. She was selected for study because of the clinical picture she presented (fever, pulmonary infiltration, hepatomegaly, anemia, and leucopenia).

History.—The present illness began in March, 4 months before admission, with a respiratory illness, diagnosed as influenza. Following this, the patient noted daily fever up to 101–103°, increasing lethargy, a 10-pound weight loss headaches, and occasional emesis.

Admission findings.—July 14, 1947: The temperature was 103° and the blood pressure 100/75. Positive physical findings included bronzing of the skin, diminished breath sounds over the left upper chest area, enlargement of the liver down to the umbilicus, and erosions of the cervix uteri with a purulent cervical discharge. The spleen and peripheral lymph nodes were not enlarged. A blood count showed 3,690,000 rbc per cu. mm. with 8.3 gm. Hgb, and 4,000 wbc cu. mm. with 67 percent polymorphonuclear leucocytes, 22 percent lymphocytes and 11 percent monocytes. A chest X-ray showed strand-like infiltration in both infraclavicular areas. Agglutination tests for typhoid fever, paratyphoid fever, brucellosis, typhus, and tularemia were negative.

⁷ To be reported in detail by Dr. T. R. Hamilton, of the Department of Pathology, University of Kansas School of Medicine.

⁸ To be reported in detail by Dr. Victor Buehler and Dr. Clare Fitzwilliam, General Hospital, Kansas City, Mo.

Skin tests.—Tuberculin and histoplasmin skin tests were negative on August 8, 1947 (24th hospital day), August 20, 1947, September 8, 1947, and September 22, 1947. In addition, skin tests with blastomycin and coccidioidin were negative (August 8, 1947).

Complement fixation tests.—Serum obtained on the 26th hospital day gave a negative complement fixation test for histoplasmosis and blastomycosis.

Mycology and bacteriology.—Cultures of blood (August 8, 1947) bone marrow (August 11, 1947, August 20, 1947) axillary and inguinal lymph nodes (August 20, 1947) and bronchoscopic aspirations (August 12, 1947) were negative for pathogenic fungi.

Cultures of pooled organs (liver, lung, lymph node, spleen) obtained at autopsy were positive for *H. capsulatum* and negative for tubercle bacilli.

Course.—During hospitalization the patient showed a daily, spiking fever, up to 105°. The anemia and leucopenia became more severe (September 15, 1947: 1,960,000 rbc per cu. mm. and 2800 wbc per cu. mm.). Lymph node biopsy was performed August 20, 1947. A histologic diagnosis of Hodgkin's disease was made on sections of the excised lymph nodes. On the basis of this diagnosis, X-ray therapy was given. Between the 43d and 67th hospital days, the patient received 3400 "r" units of deep X-ray therapy, applied over the chest, abdomen, and groin. The patient's course continued to be characterized by high daily fever and she expired October 12, 1947.

Autopsy revealed fluid accumulations in the pleural and peritoneal cavities, greyish infiltrates in both upper lung fields, tiny lesions scattered throughout the liver, and generalized enlargement of lymph nodes. Microscopic study of organ sections showed changes consistent with Hodgkin's disease in the liver, spleen, adrenals, and lymph nodes. Within the lesions in the adrenal and liver were seen large numbers of parasites having the morphologic characteristics of *H. capsulatum*.

Progressive Fatal Disease

Case 9, P. P., white female, age 6 months. The patient lived on a farm 100 miles east of Kansas City, Mo. She was selected for study because of the clinical picture she presented (fever, hepatomegaly, splenomegaly, anemia, leucopenia, and thrombocytopenia).

History.—For 4 weeks the infant cried whenever her legs were moved. Her formula was made of evaporated milk and boiled well water. No supplementary vitamin C was provided.

Admission findings.—October 21, 1947: The infant was seriously ill, with a temperature of 101°. The legs were held in a frog-like position and were apparently tender on movement or pressure. The ribs were beaded. The liver and spleen were enlarged; the peripheral nodes were not palpable. A chest X-ray showed enlargement of the right hilar node with infiltration in the right lower lung field, medially. A blood count revealed 2,120,000 rbc per cu. mm. with 4.9 gm. Hgb and 2,800 wbc per cu. mm. with 38 percent polymorphonuclear leucocytes, 58 percent lymphocytes, and 4 percent monocytes.

Skin tests.—On the 9th hospital day, tuberculin, histoplasmin, and blastomycin skin tests were negative.

Complement fixation tests.—Blood drawn on the 9th hospital day showed a 1+ complement fixation test for histoplasmosis. Blood drawn from the heart at autopsy (6 days later) gave +++ complement fixation for histoplasmosis. Neither blood specimen showed any complement fixation when blastomycin was used as the antigen.

Mycology and bacteriology.—Organisms, whose morphology was typical of *H. capsulatum*, were seen in bone marrow smears made on the 10th hospital day.

Peripheral blood cultures (October 30, 1947, October 31, 1947) and a marrow culture (October 31, 1947) were positive for *H. capsulatum*.

Smears of splenic pulp, bone marrow, and peripheral blood obtained at autopsy showed the presence of many parasites typical of *H. capsulatum*. A culture of blood obtained at autopsy was positive for *Histoplasma*. Positive cultures were obtained from pooled liver and spleen, and lung and node, as well as from one of four mice inoculated with pooled tissue.

Microscopic study of sections of liver, lung, spleen, lymph node, adrenal, bone marrow, and meninges showed the presence of myriads of *Histoplasma*.

Course.—The infant's course was characterized by continued fever (up to 103°), increasing anemia (1,950,000 rbc per cu. mm.), abdominal distension and purpura. The patient died on the 14th hospital day. Treatment consisted of transfusions, penicillin, and streptomycin.

Autopsy revealed pallor, edema, and polyserositis. The liver was enlarged, firm and almost devoid of its normal architecture. The spleen was enlarged, as were the abdominal and thoracic lymph nodes. There was hyperplasia of the lymphoid tissue in the wall of the intestine with ulceration of the mucosa over these areas. Lesions were noted in the adrenals and kidneys. There was a dense infiltrative process in the right lower lobe of the lung, with enlargement of the hilar node.

Progressive Fatal Disease

Case 10, J. W.⁹ white male, laborer, age 37. The patient was a lifetime resident of a Kansas town 20 miles northwest of Kansas City. He was referred for study because of miliary lung lesions and a negative tuberculin test.

History.—The patient first became ill, 8 months before admission, with a respiratory illness diagnosed as influenza. He never fully recovered, and for the 6 months before admission complained of abdominal pain, radiating to the back. The pain occurred several times daily and was severe enough to wake the patient at night. Over this 8-month period, the patient had lost 40 pounds in weight. Three X-ray examinations of the gastro-intestinal tract were reported as negative.

Admission findings.—October 21, 1947: The temperature was 103°. Examination disclosed emaciation, tachycardia, and a palpable spleen. The liver and peripheral lymph nodes were not enlarged. Examination of the chest was negative. A chest X-ray showed a diffuse pulmonary infiltration of unusual character, best described as a fine reticulation. A blood count showed 3,000,000 rbc per cu. mm. with 55 percent Hgb, and 6,500 wbc per cu. mm. with 83 percent polymorphonuclear leucocytes, 8 percent lymphocytes, 3 percent eosinophils, 1 percent basophils, and 5 percent transitional cells.

A blood sugar was 78 mg. percent; the NPN was 29.

Skin tests.—One week before death, tuberculin and histoplasmin skin tests were negative.

Complement fixation tests.—Serum obtained 1 week before death showed a positive (+++++) complement fixation test for histoplasmosis and blastomycosis. At a 1:2 serum dilution, complete (+++++) fixation was noted with histoplasmin but no (0) fixation was noted with blastomycin. The same findings were noted at a 1:4 serum dilution.

Mycology and Bacteriology.—No cultures were available on this patient. Tissues obtained at autopsy were studied microscopically; the lung, liver, spleen, and lymph nodes were seen to be crowded with parasites whose morphology was characteristic of *H. capsulatum*.

Course.—The patient's 17-day hospital course was terminated abruptly by a massive rectal hemorrhage. Autopsy showed "granularity" of the lungs, enlargement of the spleen and of the mesenteric lymph nodes and hyperemia of the mucosa

⁹ Reported through the kindness of Dr. Gordon Vorhees, Leavenworth, Kans.

of the rectum and sigmoid colon. No definite lesions were noted in these organs, though they cut with increased resistance.

DISCUSSION

Ten cases of histoplasmosis have been presented, nine confirmed by the isolation of *Histoplasma capsulatum* from cultures, and one confirmed by the typical microscopic appearance of intracellular parasites. In each of these cases, the diagnosis was substantiated by more than one laboratory test. Table 1 presents a summary of the various diagnostic tests which were performed and their results. It also shows that more than one positive finding occurred with each case. Furthermore, no single method gave positive results each time it was used. While the complement fixation and skin tests individually or jointly may not be considered diagnostic, their agreement in 8 of the 10 cases is worthy of note.

TABLE 1.—Results of laboratory tests performed¹ in 10 proved cases of histoplasmosis

Case No.	Skin test	Complement fixation test	Gas-tric	Spu-tum	Blood		Marrow		Culture of patient's tissue	Pathology		Culture ² of animal's spleen	X-ray
					Culture	Smear	Culture	Smear		Human tissue	Tissue of inoculated animals		
1	+	++++	+	—	—	—	—	—	—	—	—	—	+
2	+	++++	—	—	+	—	—	—	—	—	—	—	—
3	+	++++	+	—	—	—	—	—	+	+	—	+	—
4	+	++++	—	+	—	—	—	—	—	—	—	—	+
5	+	++++	+	—	—	—	—	—	—	—	—	—	+
6	+	++++	—	—	—	—	—	—	—	+	—	+	+
7	+	++++	+	—	—	—	+	—	+	+	+	+	+
8	—	—	—	—	—	—	—	—	—	+	—	—	+
9	—	++++	—	—	+	+	+	+	+	+	—	+	+
10	—	++++	—	—	—	—	—	—	—	+	—	—	+

¹ If no entry is made, test was not performed.

² Splenic culture of animals inoculated with human biopsy or autopsy tissue.

³ Granulomata present in tissues. No *Histoplasma* definitely identified.

⁴ Test result on blood obtained from heart at autopsy.

A summary of the cases by age, sex, duration of illness, and outcome is presented in table 2. Skin test, serological and X-ray data on each case are also shown.

TABLE 2.—Summary of 10 proved cases of histoplasmosis

Case	Age	Sex	Skin test	Complement fixation test	X-ray	Length of illness	Outcome
1-CD	13 years	M	Positive	++++	Positive	2½ years	Recovered.
2-WB	7 months	M	Positive	++++	Negative	5 months	Recovered.
3-SP	20 months	F	Positive	++++	Questionable	6 months	Improving.
4-GM	53 years	M	Positive	++++	Positive	3 months	Unimproved.
5-RJ	64 years	M	Positive	++++	Positive	6 months	Unimproved.
6-JG	26 years	M	Positive	++++	Positive	1 month	Death.
7-FT	48 years	M	Positive	++++	Positive	2½ years	Death.
8-EW	54 years	F	Negative	0	Positive	4 months	Death.
9-PP	6 months	F	Negative	++++	Positive	6 weeks	Death.
10-JW	37 years	M	Negative	++++	Positive	1½ years	Death.

¹ Test result on blood obtained from heart at autopsy.

As indicated in the above table, positive skin reactions were elicited with histoplasmin (H-15) in seven of the ten cases of histoplasmosis. Two of the three nonreactors were skin-tested within 1 week of death (cases 9 and 10), while the third nonreactor (case 8) had a temperature of 105° at the time of both tests. It is known that tuberculous patients who are near death or have a high temperature show a decreased sensitivity to tuberculin (10). Evidence available from other studies, to be reported later, shows that critical illness and fever similarly depress sensitivity to histoplasmin. The depression of skin sensitivity due to these factors could explain the negative histoplasmin tests both among our cases of histoplasmosis and among those reported in the literature. Histoplasmin skin test results have been previously reported in only nine proved cases of histoplasmosis (1, 11, 12, 13, 14, 15, 16). Four of the nine had positive skin tests. Of the five negative reactors, four were tested 1 month before death and one was tested 5 months before death.

Changes in skin sensitivity from negative to positive were observed in three patients. At the time of the first test, two had high fevers and presented a clinical appearance of severe illness. The third was first tested 3 weeks after the onset of illness. Although sensitization of the patients to histoplasmin is a possibility, it does not seem likely in the light of our experience in retesting thousands of nonreactors during the last 2 years. No evidence of such sensitization has been observed.

Regardless of the explanation of the initial negative test results, repeated skin tests appear to be of value since in these proved cases of histoplasmosis significant fluctuations in sensitivity occurred during the illness.

In addition to histoplasmin, the antigens specified in the section on Materials and Methods were used in some instances. Blastomycin was the only other fungus antigen with which a reaction was obtained and that only in case 3, who reacted about equally to 1:1000 histoplasmin and blastomycin. When these two antigens were diluted further (1:2000 and 1:5000), no reactions were obtained with blastomycin whereas histoplasmin produced reactions in both dilutions.

The complement fixation test for histoplasmosis was performed with the serum of each patient. Table 2 shows that antibodies were demonstrated in 9 of 10 sera. Eight sera showed complete fixation of complement (cases 1, 2, 3, 4, 5, 6, 7, 10). One serum showed partial fixation (case 9) and 1 serum was negative (case 8). Case 9 showed only 1+ fixation 1 week before death, but blood drawn from the heart at autopsy showed +++ fixation. Altogether, 90 percent of the cases had antibodies for histoplasmin in their sera. This is in sharp contrast to 5.4 percent obtained on 242 controls (6).

Complement fixation tests using blastomycin as the antigen were also performed with the undiluted serum of each patient. Three of the sera showed no fixation with blastomycin (cases 1, 8, 9). Two of the sera (cases 2, 3) showed more antibodies against histoplasmin (2 or more degrees difference of fixation), while 5 sera (cases 4, 5, 6, 7, 10) showed complete + + + + fixation with histoplasmin and blastomycin. In three of these last five (cases 4, 7, 10), complement fixation tests were set up in parallel with both histoplasmin and blastomycin as antigens, using serial dilutions of each serum (table 3).

As shown in table 3, this technic demonstrated that, in cases 4, 7, and 10, antibodies against histoplasmin were present in higher titer

TABLE 3.—*Complement fixation tests with dilutions of sera which, undiluted gave equal (+ + + +) fixation with histoplasmin and blastomycin*

Case No.	Serum dilution	Complement fixation with—	
		Histoplasmin	Blastomycin
4.....	1:2	++++	++++
	1:4	++++	+
	1:8	+	0
7.....	1:2	++++	++
	1:4	+	0
10.....	1:2	++++	0
	1:4	++++	0

than those against blastomycin. Studies are not complete on case 5; sufficient serum was not available for titration on case 6. Thus, under the conditions of the test, more antibodies were demonstrated for histoplasmin than for blastomycin in all the proved cases of histoplasmosis on whom studies were completed.

This device of diluting the antigens in skin tests and the serum in complement fixation tests in order to distinguish a specific from a cross-reaction demands careful study before its value can be determined conclusively.

The chest X-ray findings are also of interest (table 2). In two cases (6, 9) the chief finding was infiltration in and about the right hilum, extending toward the right base. In addition, case 3 showed probable infiltration in the area of the right hilum. In four cases (4, 5, 7, 8) the chief finding was a "strand-like" infiltration in both apical and sub-apical areas. Cavitation was noted only in case 5. In two cases (1 and 10) the infiltration was miliary in type. The infiltrates were larger and more discrete in case 1 than in case 10.

The isolation of *H. capsulatum* from the gastric contents of histoplasmosis patients has not previously been reported. Therefore, it

seems worthwhile to emphasize that the organism was isolated in this manner from four patients (cases 1, 3, 5, 7).

In two cases, coexistent tuberculosis and histoplasmosis were demonstrated. Tubercle bacilli were demonstrated by culture and animal inoculation in cases 6 and 7. Laboratory studies of case 5 are not complete. He is suspected of having coexistent tuberculosis because of positive tuberculin test and cavities in his lung as shown in chest X-ray. Similar coexistence of tuberculosis and histoplasmosis was found in four of the fatal cases reported in the literature (1). Case 7 represents a case of histoplasmosis which fulfilled all the clinical and pathological criteria of Hodgkin's disease and was so considered until cultural and microscopic studies were completed.

All of the cases reported lived within a radius of 200 miles of Kansas City. Five came from greater Kansas City, three lived in the State of Kansas outside Kansas City, and two in the State of Missouri, outside Kansas City, Mo.

In view of the existing belief that histoplasmosis is almost always fatal, it may be appropriate to reiterate the statement that 5 of the 10 patients are alive. Cases 1 and 2 are clinically well. Case 3 is improved and will probably recover, but in cases 4 and 5, recovery is questionable. The primary cause of death of case 6 was not histoplasmosis but postoperative surgical shock.

It has been postulated on the basis of histoplasmin skin testing and roentgenographic findings that there exists a benign form of histoplasmosis (2, 3) whose final stage is represented by pulmonary calcification. In view of the current interest in this concept, it seems worthwhile to emphasize certain facts regarding case 1. The patient fulfills the chief criterion for diagnosing histoplasmosis as he has a positive gastric culture. In addition, his serum shows complement fixation and his histoplasmin skin test is positive. His chest X-ray shows miliary lesions which are healing by calcification. He has been followed for almost 3 years and definite deposition of calcium in his lesions has been observed. During this period he has been well enough to attend school.

Of the five fatal cases, two were confirmed by culture before death and two were suspected on the basis of positive complement fixation tests.

SUMMARY

1. Ten cases of histoplasmosis in residents of the Kansas City area are described. Nine of these were proved by cultural isolation of the etiologic agent, and one by the typical pathological picture.

2. Two of the five surviving patients have apparently recovered completely. A third will probably recover and the prognosis for the fourth and fifth is doubtful.

3. Nine of the cases were diagnosed within a period of 9 months.

4. Of the 10 patients, 7 developed sensitivity to histoplasmin and complement fixing antibodies were demonstrated in the sera of these same patients. Only one patient failed to show either skin hypersensitivity or complement fixing antibodies.

5. Sensitivity to both blastomycin and histoplasmin was observed in the skin tests of one patient. Serial antigen dilutions showed that the heterologous reaction was weaker than the homologous.

6. Complement fixing antibodies for blastomycin as well as for histoplasmin were demonstrated in the sera of seven patients. In all titrated sera the antibodies against histoplasmin were present in greater amounts.

7. Pulmonary infiltration was noted by X-ray in eight cases; probable infiltration was noted in another case. Two of these eight cases presented the roentgenographic picture of miliary lung lesions.

8. *Histoplasma capsulatum* was isolated by culture from the gastric content of four patients with histoplasmosis.

ACKNOWLEDGMENT

The authors wish to acknowledge the contribution of Dr. Arden Howell, Jr. His skill and experience in medical mycology have been of inestimable value in completing the work reported here. Dr. Howell adapted the procedures employed in our laboratory for isolating *H. capsulatum* and made the final identification of the organisms recovered.

REFERENCES

- (1) Parsons, R. J., and Zarafonitis, C. J. D.: Histoplasmosis in man. Arch. Int. Med. **75**: 1-23 (1945).
- (2) Palmer, C. E.: Nontuberculous pulmonary calcification and sensitivity to histoplasmin. Pub. Health Rep. **60**: 513-520 (1945).
- (3) Christie, Amos and Peterson, J. C.: Pulmonary calcification in negative reactors to tuberculin. Am. J. Pub. Health. **35**: 1131-1147 (1945).
- (4) Peterson, J. C.: Symposium on systemic mycoses, given before Am. Academy of Pediatrics, Dallas, Texas (December 8-9, 1947).
- (5) Furcolow, M. L., Mantz, H. L., and Lewis, I.: The roentgenographic appearance of persistent pulmonary infiltrates associated with histoplasmin sensitivity. Pub. Health Rep. **62**: 1711-1718 (1947).
- (6) Furcolow, M. L., Bunnell, I. L., and Tenenberg, D. J.: A complement fixation test for histoplasmosis. II. Preliminary results with human sera. Pub. Health Rep. **63**: 169 (Feb. 1948).
- (7) Howell, Arden, Jr.: Studies of fungus antigens. I. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea pigs. Pub. Health Rep. **62**: 631-651 (1947).
- (8) Tenenberg, D. J., and Howell, Arden, Jr.: A complement fixation test for histoplasmosis. I. Technic and preliminary results on animal sera. Pub. Health Rep. **63**: 163 (Feb. 1948).
- (9) Thompson, Luther: Note on a selective medium for fungi. Proc. of the Staff Meetings of the Mayo Clinic. **20**: 248-249 (1945).
- (10) Furcolow, M. L., Howell, Barbara, and Nelson, Waldo E.: Quantitative studies of the tuberculin reaction. III. Tuberculin sensitivity in relation to active tuberculosis. Am. Rev. Tub. XLV: (5) 504 (1942).

- (11) Van Pernis, P. A., Benson, M. E., and Holinger, P. H.: Specific cutaneous reactions with histoplasmosis. *J. A. M. A.* **117**: 436-437 (1941).
- (12) McLeod, J. H., Emmons, C. W., Ross, S., and Burke, F. G.: Histoplasmosis. *J. Pediat.* **28**: 275-295 (1946).
- (13) Iams, A. M., Keith, H. M., and Weed, L. A.: Histoplasmosis in infancy: Report of a case in an infant with a brief clinicopathological review. *Proc. Staff Meet. Mayo Clin.* **21** (25): 490-495 (1946).
- (14) Davis, H. V. and Neff, F. C.: Histoplasmosis in infancy. *Am. J. Dis. Child.* **71**: 171-177 (1946).
- (15) Curtis, A. C., Cawley, E. P.: Genital histoplasmosis. *J. Urol.* **57**: 781-787 (1947).
- (16) Miller, H. E., Keddie, S. M., Johnstone, H. G., and Bostick, W. L.: Histoplasmosis. Cutaneous and mucomembranous lesions, Mycologic and Pathologic observations. *Arch. Derm. and Syph.* **56**: 715-739 (December 1947).

NEW OFFICIAL CLASSIFICATIONS FOR TUBERCULOSIS IN GREAT BRITAIN

The following revised classifications for tuberculosis were adopted by the Ministry of Health of Great Britain in May 1947. It is reprinted here for the consideration of American phthisiologists.

Revision of Section I of the Appendix to Memorandum 37/T (Revised).

SECTION I

A. Classification of Patients Suffering From Tuberculosis

For the purpose of the Annual Returns required under this memorandum, and of the case records necessary to enable these returns to be completed, the following system of classification of cases and of recording results should be used:

I.—All patients should be grouped according to their sex and age; patients under 15 years of age should be classed as children, and those of 15 years and upwards as adults.

II.—Patients should be divided into respiratory and nonrespiratory tuberculosis cases as follows:

(1) A respiratory case should be one in which there is a tuberculous lesion of the lungs, pleura, intrathoracic glands, trachea or larynx;

(2) A nonrespiratory case should be one in which a tuberculous lesion is present in one or more parts of the body other than the lungs, pleura, intrathoracic glands, trachea or larynx.

A case in which there are both respiratory and nonrespiratory lesions of clinical significance should be classified as a respiratory case.

III.—(1) Patients suffering from any form of tuberculosis should then be divided into:

Class A.—Viz., cases in which tubercle bacilli have never been discovered in any exudate, excrement, discharge or tissue.

Class B.—Viz., cases in which tubercle bacilli have been found at any time in any exudate, excrement, discharge or tissue.

A patient originally in class A (TB minus) should be transferred to class B (TB plus) at any stage in the course of treatment if and when tubercle bacilli are found, but, for purposes of classification at the time of first observation, if tubercle bacilli have not been found in any excreta or discharge prior to or during the first 8 weeks of observation or residential treatment, that patient should be considered an A case.

(2) In respiratory cases both classes A and B should be subdivided to give indication of:

- (a) The extent and degree of the lesion.
- (b) The degree of toxæmia.

The extent of the pulmonary lesion is best described by radiological zones as follows:

The upper zone.—That area above a straight line running through the lower borders of the anterior ends of the second ribs.

The middle zone.—That area bounded by the above line and one running through the lower borders of the anterior end of the fourth ribs.

The lower zone.—The remainder of the lung below the middle zone.

(3) Respiratory cases in both classes A and B should be further subdivided in three groups as follows:

Group 1.—Cases with slight constitutional disturbance, if any, e. g., there should not be marked acceleration of pulse or elevation of temperature except of very transient duration; gastro-intestinal disturbance or emaciation, if present, should not be excessive. Obvious physical signs and radiological findings should be of very limited extent. The physical signs should be either present in one lobe only, and in the case of an apical lesion of one upper lobe, not extending below the second rib in front or not exceeding an equivalent area in any one lobe; or, where these physical signs are present in more than one lobe, they should be limited to the apices of the upper lobes, and should not extend below the clavicle and the spine of the scapula.

Radiological findings should be limited to mottling involving a total area of not more than one zone.

No complications (tuberculous or other) of prognostic gravity should be present. A small area of dry pleurisy should not exclude a case from this group.

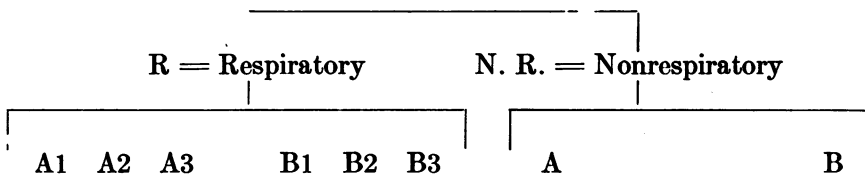
Group 3.—Cases with profound systemic disturbance or constitutional deterioration and with marked impairment of function, either local or general.

All cases with grave complications, whether they are tuberculous or not, should be classified in this group (e. g. diabetes, tuberculosis of intestines or larynx).

Group 2.—All cases which cannot be placed in groups 1 and 3.

(4) The classification indicated in the above paragraphs may be demonstrated diagrammatically as follows:

TUBERCULOSIS



As the classes A and B are defined by the success or failure to discover the tubercle bacilli in all cases of tuberculosis it is necessary to subdivide the nonrespiratory as well as the respiratory into these two classes. It is felt that by doing this the issue is clear-cut and no confusion can arise. The introduction, too, of radiological findings brings the classification into line with modern methods of diagnosis, but the value of other clinical methods has not been overlooked or discarded.

(5) *Pleural effusions.*—Uncomplicated cases of pleural effusion for which no alternative cause can be found should be regarded as tuberculous and placed in group 1 of class A and in group 1, class B, when tubercle bacilli have been demonstrated in the fluid.

(6) The single positive result. Where a single positive bacteriological report is not confirmed by further bacteriological search and is unsupported by clinical or radiological evidence of tuberculosis it may be ignored.

B. Results of Treatment

The following terms should be used to describe the results of treatment:

"Quiescent."—Cases in which the general condition and exercise tolerance are good, having regard to the extent of the lesion; which show no evidence of toxæmia; in which no tubercle bacilli have been found on three consecutive monthly examinations by stained film; and in which changes revealed by other clinical investigations and by serial skiagrams point to retrogression of the tuberculous lesion.

"Arrested."—Cases in which the disease has been "quiescent" for a continuous period of at least 2 years, or, if nonrespiratory, the disease is "quiescent" and there is reason to believe it is unlikely to recur.

"Recovered."—Cases in which the state of quiescence has continued uninterruptedly for a period of 5 years.

C. Definition of Terms Employed in the Forms of Return

1. "*Dispensary register.*"—A list of all persons examined by the tuberculosis officer at or in connection with the dispensary, together with the names of any other persons accepted by the Tuberculosis Authority for residential treatment, or for observation in residential institutions, or for orthopaedic treatment or supervision under a scheme approved by the Minister of Health for the treatment of tuberculosis.

2. "*Adults.*"—All persons of the age of 15 years and upwards.

3. "*Patient.*"—A person suffering from tuberculosis whose name is included in the Dispensary Register.

4. "*Cases.*"—This term, when used without qualification, includes not only "patients" but also all doubtfully tuberculous persons whose diagnosis has not yet been completed.

5. "*New cases.*"—See directions for completing part (A) of the annual return.

6. "*Contacts.*"—Persons coming under review by reason of having lived, worked, or closely associated with a person who has notifiable tuberculosis.

7. "*Domiciliary treatment.*"—Treatment of an insured patient by his insurance practitioner on the recommendation of the tuberculosis officer.

D. Other Definitions of Terms of Documentary Significance

1. "*Active cases.*"—Those not quiescent. All cases discharging tubercle bacilli within the preceding 3 months should be considered as "active."

2. "*Stationary cases.*"—Cases in which the signs, symptoms, clinical tests and radiological appearances of the lesions have presented no material new features during the period under review.

3. "*Rehabilitation.*"—The remedial process which aims at restoring a patient to the maximum participation in a normal life commensurate with the degree of his disability.

93205/9/13

MINISTRY OF HEALTH,
May 1947.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED FEBRUARY 14, 1948

Summary

A slight net decline was reported in the incidence of influenza. A total of 12,418 cases was reported, as compared with 12,896 last week, 3,624 for the corresponding week last year, and a 5-year (1943-47) median of 5,376. Of the current total, 8 States in the South Atlantic, South Central, Mountain, and Pacific areas reported 11,123 cases, or 90 percent (last week 11,131), as follows (last week's figures in parentheses): *Increases*—Virginia 1,237 (1,016), Alabama 537 (500), Oregon 300 (137), California 1,234 (1,067); *decreases*—South Carolina 1,065 (1,269), Arkansas 491 (637), Texas 5,087 (5,133), Arizona 1,172 (1,372). No other State reported more than 169 cases. Of the total of 71,949 cases to date this year, 63,667 (88 percent) have been reported in 7 States in the areas named above, as follows: Virginia 5,888, South Carolina 6,627, Alabama 3,499, Arkansas 3,204, Texas 29,556, Arizona 7,372, and California 7,521. Only 1,465 cases (2 percent) have been reported in States outside these areas.

Of 33 cases of poliomyelitis reported (last week 28, 5-year median 32), New York, Florida, and Texas reported 4 each, and Michigan, South Carolina, and Oregon, 3 each.

Four cases of smallpox were reported during the week—1 each in Ohio, West Virginia, Kentucky, and Texas. California reported 4 cases of psittacosis, and Delaware 1 case of anthrax. Reports for the year to date of the dysenteries (combined), measles, tularemia, and undulant fever are above the respective median expectancies.

Deaths registered in 93 large cities of the United States during the week totaled 10,032, as compared with 10,718 last week, 10,007 and 10,063, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945-47) median of 10,007. For the 7-week period ended February 14, 73,296 deaths were recorded in the same cities, as compared with 70,037 for the corresponding period last year. Infant deaths for the week totaled 670, as compared with 751 last week and 665 for the 3-year median. The total to date is 5,040 as compared with 5,796 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 14, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947	
NEW ENGLAND												
Maine.....	0	3	1	4	-----	-----	13	378	13	1	0	2
New Hampshire.....	0	1	0	-----	-----	-----	1	20	5	0	0	2
Vermont.....	0	2	0	-----	12	6	1	133	75	1	0	0
Massachusetts.....	2	19	7	7	-----	-----	415	476	415	1	2	8
Rhode Island.....	0	0	0	1	1	2	2	75	59	0	0	3
Connecticut.....	0	0	0	1	1	4	25	286	207	1	0	5
MIDDLE ATLANTIC												
New York.....	12	27	14	1 8	1 4	1 14	789	142	1,272	9	14	26
New Jersey.....	10	1	4	-----	1 6	12	829	71	284	2	5	9
Pennsylvania.....	4	23	9	(?)	1 6	1 3	807	545	1,337	7	3	16
EAST NORTH CENTRAL												
Ohio.....	11	21	13	5	6	7	914	503	126	1	4	7
Indiana.....	18	8	5	20	3	15	722	41	229	0	1	2
Illinois.....	3	7	7	7	-----	7	1,832	26	323	5	4	9
Michigan ¹	4	2	4	1	-----	4	1,296	92	215	0	2	7
Wisconsin.....	1	2	1	60	13	50	350	157	157	3	1	3
WEST NORTH CENTRAL												
Minnesota.....	3	7	7	-----	-----	1	370	32	28	2	1	1
Iowa.....	0	1	1	-----	-----	-----	907	11	29	0	1	1
Missouri.....	1	2	6	8	2	2	102	7	158	3	2	6
North Dakota.....	0	1	0	6	2	2	67	1	-----	0	1	1
South Dakota.....	2	0	2	-----	-----	-----	17	9	53	0	0	0
Nebraska.....	0	3	2	40	22	2	16	9	16	1	0	0
Kansas.....	0	6	5	169	15	14	7	7	185	0	0	0
SOUTH ATLANTIC												
Delaware.....	0	0	0	-----	4	-----	61	2	16	0	0	0
Maryland ¹	2	12	10	3	2	23	60	58	58	1	4	4
District of Columbia.....	0	0	0	1	2	3	91	10	25	1	0	1
Virginia.....	1	6	8	1,237	371	827	88	218	173	3	3	10
West Virginia.....	3	4	3	121	65	28	243	97	31	0	0	2
North Carolina.....	9	3	9	-----	-----	-----	7	183	88	4	2	7
South Carolina.....	10	3	3	1,065	409	897	39	64	59	4	0	7
Georgia.....	9	9	8	26	26	75	44	188	131	2	4	3
Florida.....	8	4	4	19	5	3	71	13	29	1	1	4
EAST SOUTH CENTRAL												
Kentucky.....	6	5	6	2	1	6	24	1	47	1	4	5
Tennessee.....	5	6	7	107	26	58	82	88	88	9	2	6
Alabama.....	5	11	11	537	94	227	59	24	38	2	3	8
Mississippi ¹	1	5	5	104	-----	-----	28	-----	-----	0	2	4
WEST SOUTH CENTRAL												
Arkansas.....	3	2	7	491	62	205	81	74	112	0	3	3
Louisiana.....	5	0	8	50	1	7	229	-----	41	1	0	5
Oklahoma.....	2	7	2	157	90	199	29	-----	37	4	1	3
Texas.....	20	32	40	5,087	2,013	2,161	1,422	107	324	7	8	16
MOUNTAIN												
Montana.....	1	0	0	18	9	37	166	233	121	1	0	0
Idaho.....	1	0	0	54	13	13	22	7	10	1	0	0
Wyoming.....	1	0	0	-----	-----	4	38	4	24	0	0	0
Colorado.....	6	8	7	119	144	86	99	43	50	1	1	1
New Mexico.....	2	3	3	1	-----	1	17	60	28	0	0	1
Arizona.....	2	3	2	1,172	177	164	11	48	18	0	0	0
Utah ¹	4	0	0	131	1	50	17	11	54	0	0	1
Nevada.....	0	0	0	2	-----	-----	-----	-----	4	0	0	0
PACIFIC												
Washington.....	3	4	4	57	1	1	241	40	153	1	1	3
Oregon.....	5	1	3	300	4	15	50	46	112	3	3	3
California.....	4	35	30	1,214	11	99	594	169	556	22	9	25
Total.....	189	299	299	12,418	3,624	5,376	13,395	4,809	11,260	106	92	244
6 weeks.....	1,395	1,878	1,919	71,949	23,966	27,124	59,016	24,090	39,542	4,503	516	1,416
Seasonal low week ¹	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low.....	7,753	9,444	10,467	115,507	56,941	56,941	93,962	46,977	65,666	1,285	1,488	3,248

¹ New York City only.

² Philadelphia only.

³ Period ended earlier than Saturday.

⁴ Correction (deducted from cumulative totals): Meningococcus meningitis, South Carolina, week ended January 24, 0 cases (instead of 1).

⁵ Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 14, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948 ^a	Feb. 8, 1947	
NEW ENGLAND												
Maine.....	0	0	0	15	34	34	0	0	0	0	0	0
New Hampshire.....	0	1	0	0	7	8	0	0	0	0	0	0
Vermont.....	0	1	0	0	3	15	0	0	0	0	0	0
Massachusetts.....	1	0	0	107	168	300	0	0	0	4	0	0
Rhode Island.....	0	1	0	10	18	21	0	0	0	0	0	0
Connecticut.....	0	0	1	26	39	59	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York.....	4	2	2	222	388	505	0	0	0	2	2	1
New Jersey.....	0	1	0	76	149	140	0	0	0	2	1	1
Pennsylvania.....	2	2	1	262	215	303	0	0	0	2	4	6
EAST NORTH CENTRAL												
Ohio.....	0	3	1	314	327	310	1	0	0	3	0	1
Indiana.....	0	0	0	80	85	97	0	0	1	1	0	0
Illinois.....	1	2	1	127	130	273	0	0	0	3	3	2
Michigan ^b	3	1	1	153	118	154	0	0	0	3	0	1
Wisconsin.....	0	0	0	69	68	192	0	0	0	0	2	1
WEST NORTH CENTRAL												
Minnesota.....	0	3	0	57	40	58	0	0	0	1	0	0
Iowa.....	0	0	0	63	60	75	0	0	0	2	1	1
Missouri.....	0	1	1	39	41	93	0	0	0	0	0	0
North Dakota.....	0	0	0	4	6	15	0	0	0	0	0	0
South Dakota.....	0	0	0	4	8	19	0	0	0	0	0	0
Nebraska.....	1	0	0	16	35	35	0	0	0	0	1	0
Kansas.....	0	1	0	39	34	91	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware.....	0	0	0	4	12	8	0	0	0	0	0	0
Maryland ^c	0	0	0	20	27	81	0	0	0	1	0	0
District of Columbia.....	0	0	0	14	14	28	0	0	0	2	0	0
Virginia.....	1	1	0	23	31	66	0	0	0	1	2	1
West Virginia.....	0	0	1	25	30	35	1	0	0	0	0	1
North Carolina.....	1	1	1	30	44	48	0	0	0	0	2	2
South Carolina.....	7	3	0	2	3	6	0	0	0	0	1	0
Georgia.....	1	0	0	16	19	21	0	0	0	4	0	2
Florida.....	4	4	1	11	17	11	0	0	0	0	2	1
EAST SOUTH CENTRAL												
Kentucky.....	0	0	1	46	45	54	1	0	0	0	1	0
Tennessee.....	1	0	1	37	44	48	0	0	0	0	1	0
Alabama.....	0	3	1	5	15	20	0	0	0	0	0	1
Mississippi ^d	0	0	0	6	9	10	0	0	0	0	1	1
WEST SOUTH CENTRAL												
Arkansas.....	0	1	0	5	5	7	0	0	0	0	4	1
Louisiana.....	0	0	0	6	1	7	0	0	0	3	0	3
Oklahoma.....	0	1	0	17	7	24	0	0	0	3	1	1
Texas.....	4	2	2	38	41	62	1	0	2	6	2	3
MOUNTAIN												
Montana.....	0	0	0	24	1	17	0	0	0	0	0	0
Idaho.....	1	0	0	3	13	18	0	0	0	0	0	0
Wyoming.....	0	0	0	3	7	6	0	0	0	0	0	0
Colorado.....	0	0	0	34	49	49	0	0	0	0	1	0
New Mexico.....	0	0	0	4	8	8	0	0	0	0	0	0
Arizona.....	0	0	0	6	11	21	0	0	0	0	0	0
Utah ^e	0	0	0	14	24	63	0	0	0	0	0	0
Nevada.....	0	0	0	0	2	2	0	0	0	0	0	0
PACIFIC												
Washington.....	1	0	2	61	34	34	0	0	0	0	1	1
Oregon.....	3	1	1	20	26	26	0	0	0	0	1	1
California.....	1	15	4	93	134	215	0	0	0	4	1	1
Total.....	33	48	32	2,250	2,646	3,823	4	0	7	48	35	43
6 weeks.....	7221	406	246	12,977	15,039	22,010	20	23	51	248	254	292
Seasonal low week ^f	(11th) Mar. 15-21			(32nd) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low.....	710,432	25,203	13,617	35,516	41,725	60,331	41	77	134	3,657	3,782	4,928

¹ Period ended earlier than Saturday.

² Dates between which the approximate low week ends. The specific date will vary from year to year.

³ Including paratyphoid fever reported separately, as follows: Massachusetts 4 (salmonella infection); New Jersey 1; Michigan 1; Maryland 1; Georgia 4; California 1.

⁴ Delayed report (included in cumulative totals only): Poliomyelitis, South Carolina, week ended January 24, 1 case.

Telegraphic morbidity reports from State health officers for the week ended Feb. 14, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Feb. 14, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Feb. 14, 1948	Feb. 8, 1947		Amebic	Bacillary	Un- specified					
NEW ENGLAND											
Maine.....	17	10	21								
New Hampshire.....	1		6								
Vermont.....	42	21	24								2
Massachusetts.....	96	197	117		5						
Rhode Island.....	6	22	21								
Connecticut.....	27	50	50								1
MIDDLE ATLANTIC											
New York.....	107	200	214	6			1				2
New Jersey.....	62	145	103	1							
Pennsylvania.....	113	152	148								2
EAST NORTH CENTRAL											
Ohio.....	130	176	176	1							1
Indiana.....	37	27	24				1				2
Illinois.....	77	128	100	2			1		4		12
Michigan ¹	130	142	106	5			1				5
Wisconsin.....	126	162	102								2
WEST NORTH CENTRAL											
Minnesota.....	14	4	22								3
Iowa.....	7	11	11								3
Missouri.....	28	25	14			3				1	2
North Dakota.....	16		2	12			2				
South Dakota.....	1	3	3								1
Nebraska.....	8	19	4								2
Kansas.....	41	18	26						1		9
SOUTH ATLANTIC											
Delaware.....	1	10	2								
Maryland ¹	13	87	60						1		2
District of Columbia.....	8	1	6								1
Virginia.....	21	84	49			121					4
West Virginia.....	32		31								
North Carolina.....	26	30	63						2		1
South Carolina.....	56	37	42	3	2						1
Georgia.....	9	7	9		4				1	2	3
Florida.....	13	41	15	1		1				1	
EAST SOUTH CENTRAL											
Kentucky.....	9	29	38								
Tennessee.....	14	25	25	1			1		1		2
Alabama.....	7	20	15							1	
Mississippi ¹	2			3					1	1	
WEST SOUTH CENTRAL											
Arkansas.....	24	7	21	6					1		1
Louisiana.....	2	6	3	1					3	1	1
Oklahoma.....	18	5	10								1
Texas.....	334	474	231	13	214	99			3	1	4
MOUNTAIN											
Montana.....	13	4	12								
Idaho.....	7	1	4								
Wyoming.....	4	1	2								
Colorado.....	25	12	15	1							9
New Mexico.....	27	10	6				1				
Arizona.....	22	34	29			14					3
Utah ¹	1		25								
Nevada.....											
PACIFIC											
Washington.....	26	44	28	1							
Oregon.....	14	16	16								1
California.....	107	108	108	3			1				
Total.....	1,921	2,605	2,304	60	225	238	8	0	18	8	83
Same week: 1947.....	2,605			77	231	127	10	0	40	38	120
Median, 1943-47.....	2,304			37	271	60	8	0	12	43	79
6 weeks: 1948.....	13,648			353	1,864	1,666	44	3	136	97	571
1947.....	14,728			262	2,391	1,380	42	1	298	307	539
Median, 1943-47.....	13,692			175	2,019	778	45	1	130	337	433

¹ Period ended earlier than Saturday.

² 3-year median 1945-47.

Anthrax: Delaware 1.

Psittacosis: California 4.

Territory of Hawaii: Bacillary dysentery 1; measles 1; whooping cough 25.

Alaska: German measles 1, chickenpox 2.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Feb. 7, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Enecephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0		0		0	2	0	0	0	0	9
New Hampshire:												
Concord	0	0		0		0	1	0	0	0	0	
Vermont:												
Barre	0	0		0		0	0	0	0	0	0	1
Massachusetts:												
Boston	4	0		1	320	1	5	0	34	0	1	14
Fall River	0	0		0		0	0	0	0	0	0	2
Springfield	0	0		0	1	0	1	0	1	0	0	
Worcester	0	0		0		0	7	0	12	0	0	5
Rhode Island:												
Providence	0	0		0	1	1	7	0	1	0	0	2
Connecticut:												
Bridgeport	0	0		0		0	0	0	11	0	0	
Hartford	0	0		0		0	2	0	1	0	0	3
New Haven	0	0		0		0	1	0	0	0	0	
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0		0	2	1	3	0	7	0	0	5
New York	10	0	2	0	606	3	82	0	74	0	1	34
Rochester	0	0		0	2	0	2	0	9	0	0	6
Syracuse	0	0		0	9	0	2	0	6	0	0	9
New Jersey:												
Camden	1	0		0	3	0	3	0	2	0	0	6
Newark	0	0		0	50	1	7	0	5	0	0	7
Trenton	1	0		0		0	2	0	6	0	0	2
Pennsylvania:												
Philadelphia	2	0	2	0	109	1	20	0	63	0	0	23
Pittsburgh	0	0	2	2		3	17	0	12	0	0	17
Reading	0	0		0	4	0	2	0	5	0	0	4
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0		0	22	0	7	0	18	0	0	2
Cleveland	1	0		1	4	1	8	0	24	0	1	21
Columbus	0	1	1	1	108	0	1	0	2	0	0	5
Indiana:												
Fort Wayne	0	0		0	2	0	5	0	3	0	0	
Indianapolis	1	1	3	5	158	0	6	0	2	0	0	1
South Bend	0	0	1	0	1	0	0	0	1	0	0	2
Terre Haute	0	0		0	53	0	3	0	0	0	0	
Illinois:												
Chicago	0	0	1	0	556	1	25	0	54	0	0	33
Springfield	0	0		0	170	2	4	0	5	0	0	2
Michigan:												
Detroit	3	0	1	0	45	0	12	0	55	0	0	25
Flint	0	0		0	2	0	6	1	3	0	0	
Grand Rapids	0	0		0	349	1	1	0	6	0	0	3
Wisconsin:												
Kenosha	0	0		0	55	0	0	0	0	0	0	2
Milwaukee	0	0		0	6	1	3	0	23	0	0	19
Racine	0	0		0	63	0	0	0	3	0	0	7
Superior	1	0		0	17	0	0	0	1	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0		0	1	0	0	0	3	0	0	8
Minneapolis	0	0		0	153	0	8	0	13	0	0	12
St. Paul	0	0		0	16	0	6	0	3	0	0	9
Missouri:												
Kansas City	0	0	6	0	4	0	6	0	3	0	0	11
St. Joseph	0	0		0		0	0	0	4	0	0	2
St. Louis	1	0	3	0	46	0	3	0	13	0	0	9

*In some instances the figures include nonresident cases.

City reports for week ended Feb. 7, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Pollomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha.....	0	0	-----	0	6	0	2	0	2	0	0	-----
Kansas:												
Topeka.....	0	0	-----	0	-----	0	2	0	1	0	0	3
Wichita.....	0	0	-----	0	-----	0	3	0	2	0	0	14
SOUTH ATLANTIC												
Delaware:												
Wilmington.....	0	0	-----	0	35	0	2	0	2	0	0	3
Maryland:												
Baltimore.....	1	0	1	1	1	0	12	0	14	0	0	17
Cumberland.....	1	0	-----	0	-----	0	0	0	4	0	0	-----
Frederick.....	0	0	-----	0	-----	0	0	0	0	0	0	-----
District of Columbia:												
Washington.....	0	0	-----	0	86	2	8	0	13	0	0	4
Virginia:												
Richmond.....	0	0	-----	1	-----	0	3	0	5	0	0	3
Roanoke.....	0	0	-----	0	-----	0	0	0	0	0	0	-----
West Virginia:												
Charleston.....	1	0	-----	0	3	0	5	0	0	0	0	1
Wheeling.....	0	0	-----	0	2	0	5	0	0	0	0	2
North Carolina:												
Raleigh.....	0	0	-----	0	2	0	3	1	1	0	0	2
Wilmington.....	4	0	-----	0	-----	0	2	0	0	0	0	3
Winston-Salem.....	1	0	-----	0	1	0	7	0	1	0	0	-----
South Carolina:												
Charleston.....	2	0	123	0	-----	1	3	0	0	0	0	11
Georgia:												
Atlanta.....	0	0	-----	0	-----	0	4	0	9	0	0	1
Brunswick.....	0	0	-----	0	-----	0	0	0	1	0	0	-----
Savannah.....	0	0	22	1	-----	0	2	0	2	0	0	-----
Florida:												
Tampa.....	0	0	3	0	17	0	2	0	2	0	0	4
EAST SOUTH CENTRAL												
Tennessee:												
Memphis.....	0	1	1	3	34	0	9	0	2	0	0	4
Nashville.....	0	0	-----	3	1	0	8	0	5	0	0	-----
Alabama:												
Birmingham.....	0	0	1	2	2	0	12	0	4	0	0	-----
Mobile.....	0	0	1	1	-----	1	2	0	1	0	0	-----
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock.....	0	0	1	0	-----	0	2	0	2	0	0	2
Louisiana:												
New Orleans.....	2	0	2	0	-----	0	5	0	3	0	0	2
Shreveport.....	0	0	-----	0	-----	0	10	0	1	0	0	-----
Oklahoma:												
Oklahoma City.....	0	1	1	0	1	0	2	0	2	0	0	-----
Texas:												
Dallas.....	0	0	-----	1	1	0	11	0	0	0	0	7
Galveston.....	0	0	-----	0	-----	0	4	0	0	0	0	-----
Houston.....	3	0	1	1	49	0	8	0	2	0	0	-----
San Antonio.....	0	0	2	2	1	0	20	0	2	0	0	7
MOUNTAIN												
Montana:												
Billings.....	0	0	-----	0	6	0	2	0	0	0	0	-----
Great Falls.....	0	0	-----	0	4	0	1	2	0	0	0	-----
Helena.....	0	0	-----	0	-----	0	0	0	0	0	0	-----
Missoula.....	0	0	-----	0	-----	0	0	0	0	0	0	-----
Idaho:												
Boise.....	0	0	-----	0	-----	0	1	0	0	0	0	-----
Colorado:												
Denver.....	2	0	8	0	50	0	2	0	6	0	0	23
Pueblo.....	0	0	-----	0	1	0	0	0	2	0	0	23
Utah:												
Salt Lake City.....	1	0	-----	0	12	0	2	0	5	0	0	-----

City reports for week ended Feb. 7, 1948—Continued

Division, State and City	Diphtheria cases	Enecephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Pollomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle.....	1	0	-----	0	13	0	4	0	6	0	0	10
Spokane.....	0	0	-----	0	-----	0	1	0	3	0	0	-----
Tacoma.....	0	0	-----	0	55	0	0	0	6	0	0	1
California:												
Los Angeles.....	2	0	96	3	28	0	4	0	20	0	0	6
Sacramento.....	0	0	-----	0	1	0	1	0	3	0	0	3
San Francisco.....	2	1	41	2	150	3	16	0	11	0	2	5
Total.....	50	5	326	31	3,500	24	482	4	633	0	5	485
Corresponding week, 1947 ¹	98	-----	70	21	1,089	-----	386	-----	712	0	6	762
Average 1943-47 ¹	80	-----	301	36	3,312	-----	449	-----	1,271	0	11	651

¹ Exclusive of Oklahoma City.² 3-year average, 1945-47.³ 5-year median, 1943-47.

Dysentery, amebic.—Cases: New York, 6; Reading 1; Chicago 1; New Orleans 1; Los Angeles 4.

Dysentery, bacillary.—Cases: Worcester 2; Philadelphia 1; Los Angeles 1.

Dysentery, unspecified.—Cases: Baltimore 4; San Antonio 2.

Typhus fever, endemic.—Cases: St. Louis 1; New Orleans 2.

Typhus fever, endemic.—Cases: New Orleans 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,563,100)

	Diphtheria cases rates	Enecephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Pollomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England.....	10.5	0.0	0.0	2.6	842	5.2	68.0	0.0	157	0.0	2.6	94
Middle Atlantic.....	6.9	0.0	2.8	0.9	363	4.2	64.8	0.0	87	0.0	0.5	52
East North Central.....	3.6	1.2	4.3	4.3	980	3.6	49.3	0.6	122	0.0	0.6	76
West North Central.....	4.0	0.0	18.1	0.0	455	0.0	100.6	0.0	88	0.0	0.0	135
South Atlantic.....	16.5	0.0	246.6	5.0	243	5.0	96.0	1.7	89	0.0	0.0	84
East South Central.....	0.0	5.9	17.7	53.1	218	5.9	183.0	0.0	71	0.0	0.0	24
West South Central.....	12.7	2.5	17.8	10.2	132	0.0	157.5	0.0	30	0.0	0.0	46
Mountain.....	23.8	0.0	63.5	0.0	580	0.0	63.5	15.9	103	0.0	0.0	365
Pacific.....	7.9	1.6	216.7	7.9	391	4.7	41.1	0.0	77	0.0	3.2	40
Total.....	7.6	0.8	49.3	4.7	529	3.6	72.9	0.6	96	0.0	0.8	73

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended January 31, 1948.—During the 4 weeks ended January 31, 1948, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox.....	29	Syphilis.....	104
Diphtheria.....	61	Tetanus.....	14
Dysentery, unspecified.....	13	Tuberculosis.....	767
Gonorrhea.....	256	Typhoid fever.....	7
Influenza.....	48	Typhus fever (murine).....	3
Malaria.....	203	Whooping cough.....	116
Measles.....	815		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 24, 1948.—During the week ended January 24, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		23	202	207	435	41	42	92	121	1,163
Diphtheria			1	18	3	1				23
Dysentery, amebic				10	2					12
German measles				5	23	9	1	7	5	50
Influenza		12		21	3				1	37
Measles				824	885	2	8	34	119	1,872
Meningitis, meningococcus			2	2	1			1	1	7
Mumps		16		244	206	49	99	45	23	682
Poliomyelitis				1				3		4
Scarlet fever	3	6	3	66	81	3	1	4	18	185
Tuberculosis (all forms)		6	14	131	33	15	14		29	242
Typhoid and paratyphoid fever				7	1				4	12
Undulant fever				4	2					6
Veneral diseases:										
Gonorrhea	3	10	15	102	86	32	27	48	75	398
Syphilis	1	10	7	45	54	9	13	5	31	175
Other forms									1	1
Whooping cough			1	45	13	17	1	41	23	141

MEXICO

Mexicali—Cerebrospinal meningitis.—As of January 19, 44 cases of cerebrospinal meningitis, with 3 deaths, had been reported in Mexicali, Mexico, since the outbreak there in December. It was stated that most of the patients had been in contact with Mexican agricultural workers who had returned from the United States. (See the Public Health Report for January 16, 1948. p. 95.)

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Argentina—Buenos Aires Province—El Tigre.—For the period January 4–9, 1948, 3 cases of plague were reported in El Tigre, Buenos Aires Province, Argentina. El Tigre is located near the city of Buenos Aires.

British East Africa—Tanganyika— Singida District—Tintigula.—On January 9, 1948, 1 case of plague was reported in the village of Tintigula, Singida District, Tanganyika, British East Africa. This is the first reported case of plague in Tanganyika since the year 1941.

Peru.—During the month of December 1947, 7 cases of plague with 3 deaths were reported in Pativilca valley, Chancay Province, Lima Department, and 1 fatal case was reported in the city of Chiclayo, Lambayeque Department, Peru.

Smallpox

Dahomey.—For the period January 21–31, 1948, 43 cases of smallpox with 6 deaths were reported in Dahomey.

India—Calcutta.—For the week ended January 31, 1948, 370 cases of smallpox with 281 deaths were reported in Calcutta, India. For the week ended February 7, 526 cases of smallpox were reported.

Siam (Thailand)—Bangkok.—For the period January 18–31, 1948, 52 cases of smallpox were reported in Bangkok, Siam.

DEATHS DURING WEEK ENDED FEB. 7, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 7, 1948	Correspond- ing week, 1947
Data for 93 large cities of the United States:		
Total deaths.....	10,718	9,663
Median for 3 prior years.....	9,953	
Total deaths, first 6 weeks of year.....	63,264	60,030
Deaths under 1 year of age.....	751	783
Median for 3 prior years.....	668	
Deaths under 1 year of age, first 6 weeks of year.....	4,370	4,970
Data from industrial insurance companies:		
Policies in force.....	66,880,436	67,295,456
Number of death claims.....	13,959	12,464
Death claims per 1,000 policies in force, annual rate.....	10.9	9.7
Death claims per 1,000 policies, first 6 weeks of year, annual rate.....	10.3	9.9